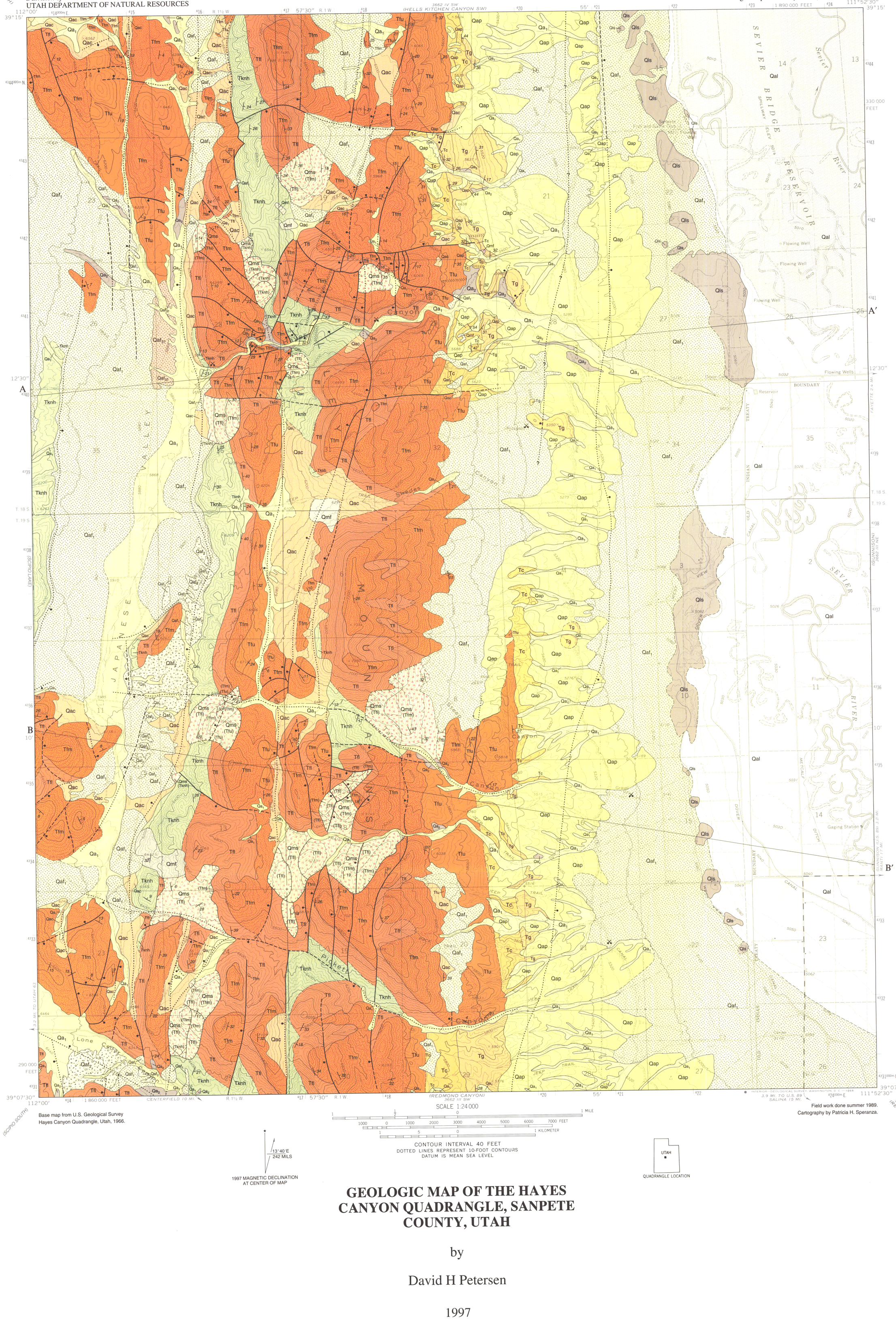
UTAH GEOLOGICAL SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES

Plate 1
Utah Geological Survey Miscellaneous Publication 97-3
Geologic Map of the Hayes Canyon Quadrangle



Base map from U.S. Geological Survey
Hayes Canyon Quadrangle, Utah, 1966.

Field work done summer 1989.
Cartography by Patricia H. Speranza.

SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

13°40′E
242 MILS
1997 MAGNETIC DECLINATION
AT CENTER OF MAP

QUADRANGLE LOCATION

GEOLOGIC MAP OF THE HAYES CANYON QUADRANGLE, SANPETE COUNTY, UTAH

by

David H Petersen

1997

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Plate 2
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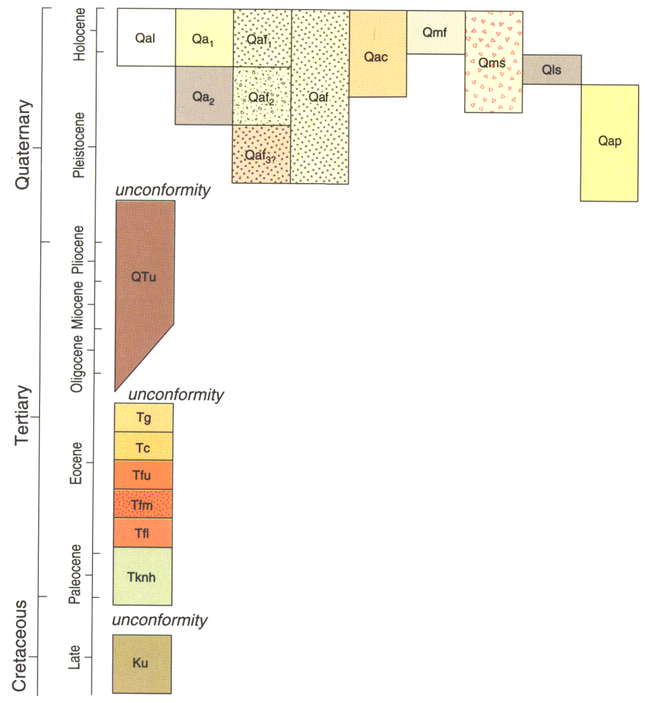
Geologic Map of the Hayes Canyon Quadrangle

CORRELATION OF MAP UNITS



SYSTEM	SERIES	FORMATION		SYMBOL	THICKNESS feet (meters)	LITHOLOGY	COMMENTS
Q		surficial deposits		Q	<200(61)		unconsolidated sediment
Tertiary	Eocene	Green River Formation		Tg	400+ (120+)		chert chert
		Colton Formation		Tc	300-450 (90-135)		volcanic ash beds volcanic ash beds volcanic ash beds
		Flagstaff Formation	Upper member	Tfu	250-300 (75-90)		snails, fish bones, ostracodes chert gypsum
			Middle member	Tfm	175-300 (50-90)		slightly oolitic
	?		Lower member	Tfl	450 (135)		snails
	Paleocene	North Horn Formation		Tknh	450+ (135+)		oncolites point bar deposits carbonaceous oncolites

MAP SYMBOLS

Contact--dashed where approximately located

Fault--dashed where approximately located, dotted where concealed, queried where hypothetical; bar and ball on downthrown side; number indicates dip of fault plane

Strike and dip of bedding

Landslide or slump block scarp

Gravel or road-fill pit

Location of measured section traverses

DESCRIPTION OF MAP UNITS

Qu — Undivided surficial deposits -- *Shown only on cross sections.*

Qal — Floodplain deposits -- *Consisting mainly of fine-grained sediments; gradational with other Quaternary deposits.*

Qa_1 — Younger alluvial deposits -- *Moderately sorted, clay- to small boulder-sized sediments; gradational with other Quaternary deposits; deposited in stream channels.*

Qa_2 — Older alluvial deposits -- *Moderately sorted, clay- to small boulder-sized sediments; isolated by downcutting; gradational with other Quaternary deposits; deposited in stream channels.*

Qaf — Undifferentiated alluvial-fan deposits -- *Shown only on the cross sections.*

Qaf_1 — Younger alluvial-fan deposits -- *Poorly to moderately sorted boulders to clay; finer clasts predominate valleyward; sediments were derived locally; gradational with other Quaternary deposits.*

Qaf_2 — Older alluvial-fan deposits -- *Dissected by Qaf_1 deposits and composed of poorly to moderately sorted boulders to clay.*

$Qaf_{3?}$ — Oldest alluvial-fan deposits -- *Dissected by Qaf_1 deposits; composed of poorly to moderately sorted boulders to clay which fine valleyward; appear to be higher and more dissected than Qaf_2 deposits.*

Qap — Alluvial pediment-mantle deposits -- *Materials composed of boulders to clay; loosely consolidated with calcareous mud; sediments were derived from nearby rock formations, predominately the North Horn and Flagstaff Formations; lies unconformably on underlying formations; 0 to 44+ feet (0-13+ m) thick.*

Qac — Mixed alluvial and colluvial deposits -- *Along mountainsides; poorly sorted boulder- to clay-sized clasts; gradational with other Quaternary deposits.*

Qmf — Mass-movement - mudflow and debris-flow deposits -- *Very poorly sorted; locally contain blocks many feet across; derived from the North Horn and lower Flagstaff Formations; form hummocky topography.*

Qms — Mass-movement - landslides and slump blocks -- *Large blocks of competent North Horn (Tknh) and Flagstaff Formation; lower member (Tfl), middle member (Tfm), upper member (Tfu), rocks that have slumped and rotated where slopes have been oversteepened, mainly along stream beds and major faults.*

Qls — Lake Bonneville sediments -- *Alternating layers of loosely consolidated, pale-tan, fine sand and silt; thinly laminated with some cross-stratification; silt increases upward; the surface of many deposits are reworked by wind, forming eolian deposits up to 6 feet (2 m) thick.*

QTu — Undifferentiated Quaternary and Tertiary deposits -- *May include late Eocene to Pliocene sedimentary, volcanic, and volcaniclastic strata, and Pliocene to Pleistocene unconsolidated valley-fill deposits; shown only on the cross sections.*

Tg — Green River Formation -- *Predominantly calcareous to dolomitic, greenish-gray mudstone intermixed with thin, locally sandy, pale-tan, micritic limestone and dolomite, some of which contain thin, discontinuous beds of chert; local thin volcanic ash layers occur in mudstones; at least 400 feet (120 m) thick.*

Tc — Colton Formation -- *Reddish-brown, with lesser amounts of greenish-gray, calcareous to dolomitic mudstone, intermixed with uncommon thin beds of pale-tan, dolomitic, micritic limestone, and volcanic ash layers; erodes to form a strike valley; 300 to 450 feet (90-135 m) thick.*

Tfu — Upper member of the Flagstaff Formation -- *Pale-gray, pale-yellow, pink, and pale-green micritic limestone, changing upward to purplish-red dolomitic and greenish-gray calcareous mud-stone that locally contains gypsum, topped by pale-tan-gray micritic limestone that locally contains chert pods; 250 to 300 feet (75-90 m) thick.*

Tfm — Middle member of the Flagstaff Formation -- *Pink-gray to white, soft limestone with minor gray, resistant limestone; capped by resistant, gray, sandy, micritic limestone changing upward to pink, tan, sandy, micritic limestone; both contain minor conglomerate and oolite grains; changes southward to very pale-gray limestone that erodes to a scalloped surface; 175 to 300 feet (50-90 m) thick; thins northward and southward.*

Tfl — Lower member of the Flagstaff Formation -- *Pale-tan, pink-tan, gray and olive-tan, micritic, chippy, locally dolomitic limestone containing abundant gastropods, which become less common upwards; has thin sandstone layers at base which thicken southward; about 450 feet (135 m) thick. Gradational with the North Horn Formation.*

Tknh — North Horn Formation -- *Intermixed, resistant, brown to gray conglomeratic and calcareous sandstone, and gray to tan, locally carbonaceous mudstone and oncolitic limestone; conglomerate contains abundant gray limestone and white quartzite pebbles; conglomerate and sandstone ledges pinch out laterally, contain cross-bedded sandstone, and have been bioturbated; about 450 feet (135 m) is exposed.*

Ku — Undifferentiated Cretaceous deposits -- *Shown only on the cross sections.*